MASTER

SOLAR/1087-79/01

Monthly Performance Report

ORTIZ & REILL DEVELOPERS, INC.
HOUSE LOT 8

JANUARY 1979

DEPARTMENT OF ENERGY · UNITED STATES OF AMERICA

U.S. Department of Energy

National Solar Heating and
Cooling Demonstration Program

National Solar Data Program

MONTHLY PERFORMANCE REPORT

ORTIZ & REILL DEVELOPERS, INC.
HOUSE LOT 8

JANUARY 1979

I. SYSTEM DESCRIPTION

The Ortiz & Reill Developers, Inc., House Lot 8, is one of two instrumented single-family residences in Escondido, California. The home has approximately 1536 square feet of conditioned space. Solar energy is used for domestic-hot-water (DHW) heating and space heating. The solar energy system has an array of flat-plate collectors with a gross area of 192 square feet. The array faces 29 degrees east of south at an angle of 45 degrees to the horizontal. Water is the transfer medium that delivers solar energy from the collector array to storage and to the space heating and hot water loads. Solar energy is stored in a 750-gallon tank located in the ground floor utility room. Heated city water is stored in a 66-gallon DHW tank. When solar energy is insufficient to satisfy the space heating load, a gas furnace provides auxiliary energy for the space heating system. Similarly, an electrical heating element in the DHW tank provides auxiliary energy for DHW heating. Energy from an hydronic fireplace radiates directly into the living space and supplements solar modes 1 and 2. The fireplace-to-storage mode activates if the fireplace is being used, the temperature difference between its water plenum and storage output is more than 9°F, and there is no demand for space heating. During operation, water is circulated from storage through the fireplace heat exchanger. The system, shown schematically in Figure 1, has four modes of solar operation.

Mode 1 - Collector-to-Storage: This mode activates when the temperature at the outlet of the collector array exceeds the temperature at the bottom of the storage tank by more than 9°F. Water is circulated from the tank through the collectors until the temperature difference is less than 3°F.

Mode 2 - Storage-to-Space Heating: This mode activates when the manually preset thermostat located in the heated space indicates a demand for space heating. Heated water is circulated from storage through a heat exchanger in the air-handling unit and returned to storage. If the demand cannot be satisfied by energy from storage, the gas furnace is activated to provide auxiliary heat. The fireplace can also add energy to the water circulating from storage before it enters the air-handling unit. If the fireplace is being used and the temperature difference between its water plenum and storage output is more than 9°F, valve D400 is activated and energy is added to the water from the fireplace heat exchanger.

Mode 3 - Storage-to-DHW: This mode activates when there is a temperature difference exceeding a pre-set differential between storage and the DHW tank and there is no demand for space heating. Incoming city water enters the DHW tank, where it is heated by water circulating from storage through a heat exchanger in the tank.

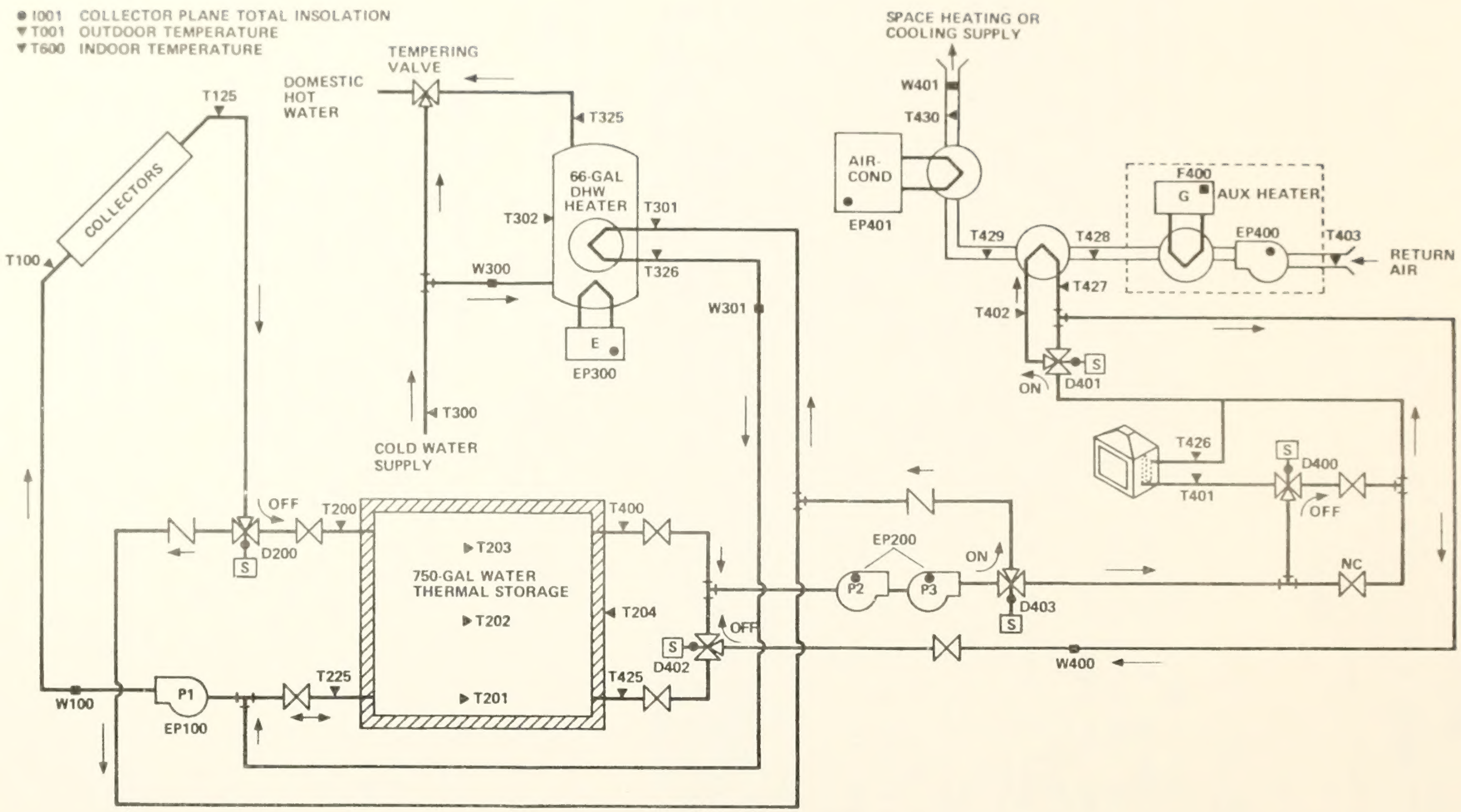

Figure 1. ORTIZ AND REILL DEVELOPERS, INC., LOT NO. 8 SOLAR ENERGY SYSTEM SCHEMATIC

Mode 4 - Collector-to-DHW: This mode activates when the temperature in the DHW tank falls below 140°F and the collector output temperature exceeds the DHW tank temperature. Water circulates through the heat exchanger in the DHW tank and returns to the collectors.

II. PERFORMANCE EVALUATION

INTRODUCTION

The site was occupied in January and the solar energy system operated continuously during the month. Solar energy satisfied 51 percent of the DHW requirements and 26 percent of the space heating requirements. The solar energy system provided electrical energy savings of 0.11 million Btu and a fossil fuel energy savings of 0.56 million Btu.

WEATHER CONDITIONS

During the month, total incident solar energy on the collector array was 6.4 million Btu for a daily average of 1077 Btu per square foot. This was below the estimated average daily solar radiation for this geographical area during January of 1504 Btu per square foot for a plane facing 29 degrees east of south with a tilt of 45 degrees to the horizontal. The average ambient temperature during January was 51°F as compared with the long-term average for January of 55°F. The number of heating degree-days for the month (based on a 65°F reference) was 428, as compared with the long-term average of 314. The number of cooling degree-days was zero, as compared with the average of 10.

THERMAL PERFORMANCE

Collector - The total incident solar radiation on the collector array for the month of January was 6.4 million Btu. During the period the collector loop was operating the total insolation amounted to 5.1 million Btu. The total collected solar energy for the month of January was 1.7 million Btu, resulting in a collector array efficiency of 26 percent, based on total incident insolation. Solar energy delivered from the collector array to storage was 0.80 million Btu, while solar energy delivered from the collector array directly to the loads amounted to 0.30 million Btu. Energy loss during transfer from the collector array to storage and loads was 0.60 million Btu. This loss represented 35 percent of the energy collected. Operating energy required by the collector loop was 0.064 million Btu.

Storage - Solar energy delivered to storage was 0.80 million Btu and auxiliary energy contribution to storage was 0.18 million Btu. There were 0.46 million Btu delivered from storage to the DHW and space heating subsystems. Energy loss from storage was 0.54 million Btu and represented 55 percent of the energy delivered to storage. The storage efficiency was 45 percent: This is calculated as the ratio of the sum of the energy removed from storage and the change in stored energy, to the energy delivered to storage. The average storage temperature for the month was 92°F.

DHW Load - The DHW subsystem consumed 0.42 million Btu of solar energy and 0.49 million Btu of auxiliary electrical energy to satisfy a hot water load of 0.96 million Btu. The solar fraction of this load was 51 percent. The DHW subsystem consumed a total of 0.22 million Btu of operating energy, resulting in an electrical energy savings of 0.20 million Btu. The amount of solar energy used by the DHW subsystem is believed to be slightly greater than indicated. This discrepancy is attributed to problems in data resolution and to temperature sensor resolution limitations. The DHW solar fraction and energy savings are believed to be slightly greater than indicated for the same reasons. A daily average of 54 gallons of DHW was consumed at an average temperature of 132°F delivered from the tank.

Space Heating Load - The space heating subsystem consumed 0.34 million Btu of solar energy and 1.0 million Btu of auxiliary thermal energy (equivalent to 1.7 million Btu of auxiliary fossil fuel energy) to satisfy a space heating load of 1.3 million Btu. The solar fraction of this load was 26 percent. The space heating subsystem consumed a total of 0.23 million Btu of operating energy, resulting in an electrical energy expense of 0.027 million Btu and a fossil fuel energy savings of 0.56 million Btu.

OBSERVATIONS

In satisfying 34 percent of the combined DHW and space heating demand a total of 1.1 million Btu was lost from the system. The system loss represented 65 percent of the energy collected.

For several hours during the month the control system allowed simultaneous operation in the conventional space heating mode and the storage-to-space heating mode. This resulted in an small amount of fossil fuel energy being transferred to storage from the space heating subsystem.

The fireplace operated intermittently during the month in the fireplace-to-storage mode and contributed approximately 0.17 million Btu to storage.

Fireplace contribution was insignificant during January. There was erratic operation in the fireplace and storage-to-space heating mode for only 20 minutes during the month.

ENERGY SAVINGS

The solar energy system provided a net electrical energy savings of 0.11 million Btu and a fossil fuel energy savings of 0.56 million Btu. The DHW subsystem provided an electrical energy savings of 0.20 million Btu, while the space heating subsystem incurred an electrical energy expense of 0.027 million Btu and fossil fuel energy savings of 0.56 million Btu.

III. ACTION STATUS

The grantee is investigating and implementing control system improvements. No additional action is planned at this time.

SOLAR HEATING AND COOLING DEMONSTRATION PROGRAM

MONTHLY REPORT
SITE SUMMARY

SITE: ORTIZ AND REILL, LOT 8 ESCONDIDO, CALIFORN SOLAR/1087-79/01
REPORT PERIOD: JANUARY,1979

SITE/SYSTEM DESCRIPTION:
ORTIZ AND REILL IS A SINGLE FAMILY DWELLING. THE SOLAR ENERGY SYSTEM PROVIDES SPACE HEATING AND DOMESTIC HOT WATER HEATING. WATER IS USED AS THE ENERGY COLLECTION AND STORAGE MEDIUM. SOLAR ENERGY IS SUPPLIED TO THE DHW TANK THROUGH A HEAT EXCHANGER WHICH CONNECTS TO THE COLL-ECTION LOOP OR TO THE STORAGE TANK. ELECTRICAL RESISTANCE COILS PRO-VIDE AUXILIARY ENERGY AS REQUIRED. SOLAR ENERGY IS SUPPLIED TO THE SPACE HEATING SYSTEM FROM THE STORAGE TANK. A FIREPLACE AND A GAS FIRED FURNACE PROVIDE AUXILIARY ENERGY AS REQUIRED.

GENERAL SITE DATA:

INCIDENT SOLAR ENERGY	6.409 MILLION BTU
	33379 BTU/SQ.FT.
COLLECTED SOLAR ENERGY	1.695 MILLION BTU
	8826 BTU/SQ.FT.
AVERAGE AMBIENT TEMPERATURE	51 DEGREES F
AVERAGE BUILDING TEMPERATURE	69 DEGREES F
ECSS SOLAR CONVERSION EFFICIENCY	0.12
ECSS OPERATING ENERGY	0.064 MILLION BTU
TOTAL SYSTEM OPERATING ENERGY	0.513 MILLION BTU
TOTAL ENERGY CONSUMED	4.431 MILLION BTU

SUBSYSTEM SUMMARY:

	HOT WATER	HEATING	COOLING	SYSTEM TOTAL
LOAD	0.958	1.306	N.A.	2.165 MILLION BTU
SOLAR FRACTION	51	26	N.A.	34 PERCENT
SOLAR ENERGY USED	0.417	0.338	N.A.	0.755 MILLION BTU
OPERATING ENERGY	0.219	0.230	N.A.	0.513 MILLION BTU
AUX. THERMAL ENERGY	0.494	0.962	N.A.	1.462 MILLION BTU
AUX. ELECTRIC FUEL	0.494	N.A.	N.A.	0.494 MILLION BTU
AUX. FOSSIL FUEL	N.A.	1.719	N.A.	1.719 MILLION BTU
ELECTRICAL SAVINGS	0.198	-0.027	N.A.	0.108 MILLION BTU
FOSSIL SAVINGS	N.A.	0.563	N.A.	0.563 MILLION BTU

SYSTEM PERFORMANCE FACTOR: 0.427

* DENOTES UNAVAILABLE DATA
@ DENOTES NULL DATA
N.A. DENOTES NOT APPLICABLE DATA

REFERENCE: USER'S GUIDE TO THE MONTHLY PERFORMANCE REPORT OF THE NATIONAL SOLAR DATA PROGRAM,FEBRUARY 28,1978, SOLAR/0004-78/18

SOLAR HEATING AND COOLING DEMONSTRATION PROGRAM

MONTHLY REPORT
SITE SUMMARY

SITE: ORTIZ AND REILL, LOT 8 ESCONDIDO, CALIFORN SOLAR/1087-79/01
REPORT PERIOD: JANUARY,1979

SITE/SYSTEM DESCRIPTION:
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GENERAL SITE DATA:

INCIDENT SOLAR ENERGY	6.761 GIGA JOULES
	379052 KJ/SQ.M.
COLLECTED SOLAR ENERGY	1.788 GIGA JOULES
	100228 KJ/SQ.M.
AVERAGE AMBIENT TEMPERATURE	11 DEGREES C
AVERAGE BUILDING TEMPERATURE	21 DEGREES C
ECSS SOLAR CONVERSION EFFICIENCY	0.12
ECSS OPERATING ENERGY	0.067 GIGA JOULES
TOTAL SYSTEM OPERATING ENERGY	0.541 GIGA JOULES
TOTAL ENERGY CONSUMED	4.675 GIGA JOULES

SUBSYSTEM SUMMARY:

	HOT WATER	HEATING	COOLING	SYSTEM TOTAL
LOAD	1.010	1.378	N.A.	2.284 GIGA JOULES
SOLAR FRACTION	51	26	N.A.	34 PERCENT
SOLAR ENERGY USED	0.440	0.357	N.A.	0.797 GIGA JOULES
OPERATING ENERGY	0.231	0.243	N.A.	0.541 GIGA JOULES
AUX. THERMAL ENG	0.521	1.015	N.A.	1.542 GIGA JOULES
AUX. ELECTRIC FUEL	0.521	N.A.	N.A.	0.521 GIGA JOULES
AUX. FOSSIL FUEL	N.A.	1.814	N.A.	1.814 GIGA JOULES
ELECTRICAL SAVINGS	0.209	-0.028	N.A.	0.114 GIGA JOULES
FOSSIL SAVINGS	N.A.	0.594	N.A.	0.594 GIGA JOULES

SYSTEM PERFORMANCE FACTOR: 0.427

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REFERENCE: USER'S GUIDE TO THE MONTHLY PERFORMANCE REPORT OF THE NATIONAL SOLAR DATA PROGRAM,FEBRUARY 28,1978, SOLAR/0004-78/18

SOLAR HEATING AND COOLING DEMONSTRATION PROGRAM

MONTHLY REPORT
ENERGY COLLECTION AND STORAGE SUBSYSTEM (ECSS)

SITE: ORTIZ AND REILL, LOT 8 ESCONDIDO, CALIFORN SOLAR/1087-79/01
REPORT PERIOD: JANUARY,1979

DAY OF MONTH	INCIDENT SOLAR ENERGY MILLION BTU	AMBIENT TEMP DEG-F	ENERGY TO LOADS MILLION BTU	AUX THERMAL TO ECSS MILLION BTU	ECSS OPERATING ENERGY MILLION BTU	ECSS ENERGY REJECTED MILLION BTU	ECSS SOLAR CONVERSION EFFICIENCY
1	0.361	48	0.042	0.000	0.004	N	0.117
2	0.217	58	0.019	0.001	0.003	O	0.086
3	0.218	53	0.022	0.000	0.003	T	0.100
4	0.302	54	0.020	0.007	0.005		0.067
5	0.064	55	0.000	0.000	0.000	A	0.007
6	0.090	55	0.011	0.014	0.001	P	0.123
7	0.224	56	0.030	0.018	0.004	P	0.135
8	0.360	54	0.024	0.000	0.004	L	0.066
9	0.077	54	0.010	0.000	0.000	I	0.128
10	0.327	52	0.022	0.000	0.003	C	0.066
11	0.252	53	0.020	0.000	0.003	A	0.080
12	0.116	56	0.024	0.000	0.001	B	0.208
13	0.273	55	0.007	0.039	0.002	L	0.026
14	0.158	52	0.015	0.000	0.001	E	0.094
15	0.058	52	0.003	0.000	0.000		0.050
16	0.114	57	0.008	0.000	0.000		0.071
17	0.091	52	0.003	0.000	0.000		0.030
18	0.127	47	0.007	0.000	0.002		0.056
19	0.344	46	0.021	0.000	0.004		0.061
20	0.311	51	0.018	0.001	0.003		0.060
21	0.137	51	0.013	0.000	0.001		0.095
22	0.168	50	0.015	0.000	0.003		0.090
23	0.365	54	0.079	0.001	0.004		0.216
24	0.074	53	0.053	0.000	0.000		0.716
25	0.132	48	0.005	0.000	0.000		0.035
26	0.380	45	0.022	0.000	0.004		0.057
27	0.399	46	0.026	0.000	0.004		0.065
28	0.123	43	0.039	0.021	0.000		0.320
29	0.369	41	0.050	0.001	0.003		0.135
30	0.096	47	0.092	0.000	0.000		0.956
31	0.081	49	0.035	0.080	0.000		0.433
SUM	6.409	-	0.755	0.184	0.064	N.A.	-
AVG	0.207	51	0.024	0.006	0.002	N.A.	0.118
NBS ID	G001	N113			G102		N111

* DENOTES UNAVAILABLE DATA.
@ DENOTES NULL DATA.
N.A. DENOTES NOT APPLICABLE DATA.

SOLAR HEATING AND COOLING DEMONSTRATION PROGRAM

MONTHLY REPORT
COLLECTOR ARRAY PERFORMANCE

SITE: ORTIZ AND REILL, LOT 8 ESCONDIDO, CA SOLAR/1087-79/01
REPORT PERIOD: JANUARY,1979

DAY OF MONTH	INCIDENT SOLAR ENERGY MILLION BTU	OPERATIONAL INCIDENT ENERGY MILLION BTU	COLLECTED SOLAR ENERGY MILLION BTU	DAYTIME AMBIENT TEMP DEG F	COLLECTOR ARRAY EFFICIENCY
1	0.361	0.355	0.062	62	0.172
2	0.217	0.190	0.038	67	0.174
3	0.218	0.199	0.044	68	0.200
4	0.302	0.299	0.054	73	0.178
5	0.064	0.023	0.001	57	0.022
6	0.090	0.038	0.009	57	0.103
7	0.224	0.217	0.061	63	0.270
8	0.360	0.337	0.164	66	0.455
9	0.077	0.015	0.003	55	0.043
10	0.327	0.290	0.126	65	0.387
11	0.252	0.207	0.073	64	0.289
12	0.116	0.086	0.024	62	0.211
13	0.273	0.237	0.098	*	0.361
14	0.158	0.105	0.023	62	0.148
15	0.058	0.000	0.000	56	0.000
16	0.114	0.009	-0.000	64	-0.000
17	0.091	0.028	-0.005	54	-0.051
18	0.127	0.092	0.028	51	0.220
19	0.344	0.315	0.108	55	0.315
20	0.311	0.280	0.110	67	0.354
21	0.137	0.083	0.020	63	0.149
22	0.168	0.149	0.028	60	0.165
23	0.365	0.341	0.164	68	0.450
24	0.074	0.008	-0.003	61	-0.046
25	0.132	0.058	0.018	52	0.133
26	0.380	0.355	0.174	59	0.457
27	0.399	0.358	0.148	61	0.370
28	0.123	0.032	-0.006	49	-0.046
29	0.369	0.326	0.124	53	0.335
30	0.096	0.020	0.005	54	0.054
31	0.081	0.038	0.001	52	0.008
SUM	6.409	5.089	1.695	-	-
AVG	0.207	0.164	0.055	60	0.264
NESID	Q001		Q100		N100

* DENOTES UNAVAILABLE DATA.
@ DENOTES NULL DATA.
N.A. DENOTES NOT APPLICABLE DATA.

SOLAR HEATING AND COOLING DEMONSTRATION PROGRAM

MONTHLY REPORT
STORAGE PERFORMANCE

SITE: ORTIZ AND REILL, LOT 8 ESCONDIDO, CA SOLAR/1087-79/01
REPORT PERIOD: JANUARY,1979

DAY OF MONTH	ENERGY TO STORAGE MILLION BTU	ENERGY FROM STORAGE MILLION BTU	CHANGE IN STORED ENERGY MILLION BTU	STORAGE AVERAGE TEMP DEG F	STORAGE EFFICIENCY
1	-0.011	0.003	-0.029	88	2.494
2	0.005	0.004	-0.019	85	-2.741
3	0.002	0.002	-0.010	82	-3.314
4	0.004	0.001	-0.010	80	-1.926
5	0.004	0.001	-0.004	79	-0.737
6	0.022	0.002	0.041	80	2.010
7	0.020	0.004	0.019	86	1.155
8	0.071	0.001	0.048	94	0.692
9	-0.000	0.011	-0.034	95	122.345
10	0.068	0.003	0.053	97	0.840
11	0.023	0.006	-0.009	101	-0.140
12	0.006	0.018	-0.032	97	-2.531
13	0.109	0.002	0.088	101	0.825
14	0.018	0.014	-0.032	107	-0.989
15	0.000	0.005	-0.040	100	1.000
16	0.000	0.012	-0.032	94	-70.848
17	0.000	0.005	-0.020	90	-30.142
18	0.005	0.002	-0.007	87	-0.905
19	0.050	0.006	0.048	90	1.079
20	0.066	0.008	0.041	99	0.749
21	0.009	0.011	-0.035	99	-2.663
22	0.000	0.012	-0.037	93	-52.538
23	0.083	0.045	0.030	91	0.906
24	-0.000	0.046	-0.063	86	55.600
25	0.018	0.005	-0.009	83	-0.241
26	0.096	0.001	0.094	93	0.984
27	0.107	0.036	0.050	106	0.810
28	0.019	0.031	-0.034	104	-0.143
29	0.099	0.053	0.015	108	0.692
30	0.005	0.085	-0.110	90	-5.060
31	0.084	0.020	0.019	81	0.465
SUM	0.982	0.456	-0.017	-	-
AVG	0.032	0.015	-0.001	92	0.446
NBS ID	Q200	Q201	Q202		N108

* DENOTES UNAVAILABLE DATA.
@ DENOTES NULL DATA.
N.A. DENOTES NOT APPLICABLE DATA.

SOLAR HEATING AND COOLING DEMONSTRATION PROGRAM

MONTHLY REPORT
HOT WATER SUBSYSTEM

SITE: ORTIZ AND REILL, LOT 8 ESCONDIDO, CALIFORN SOLAR/1087-79/01
REPORT PERIOD: JANUARY,1979

DAY OF MON.	HOT WATER LOAD MILLION BTU	SOLAR FR. OF LOAD PER CENT	SOLAR ENERGY USED MILLION BTU	OPER ENERGY MILLION BTU	AUX THERMAL USED MILLION BTU	AUX ELECT FUEL MILLION BTU	AUX FOSSIL FUEL MILLION BTU	ELECT ENERGY SAVINGS MILLION BTU	FOSSIL ENERGY SAVINGS MILLION BTU	SUP. WAT. TEMP DEG F	HOT WAT. TEMP DEG F	HOT WATER USED GAL
1	0.055	88	0.042	0.009	0.012	0.012	N	0.033	N	61	138	86
2	0.057	73	0.018	0.009	0.015	0.015	O	0.009	O	63	133	103
3	0.032	65	0.022	0.009	0.015	0.015	T	0.013	T	64	134	56
4	0.032	61	0.020	0.007	0.017	0.017		0.013		63	137	57
5	0.024	59	0.000	0.013	0.014	0.014	A	-0.012	A	63	134	43
6	0.035	40	0.011	0.012	0.026	0.026	P	-0.001	P	64	132	66
7	0.048	55	0.030	0.008	0.013	0.013	P	0.022	P	65	131	90
8	*	*	0.024	0.004	0.013	0.013	L	0.020	L	*	*	*
9	0.057	63	0.010	0.008	0.010	0.010	I	0.002	I	65	133	96
10	0.023	56	0.022	0.004	0.010	0.010	C	0.017	C	64	134	39
11	0.043	66	0.020	0.004	0.007	0.007	A	0.016	A	63	128	74
12	0.033	64	0.024	0.007	0.022	0.022	B	0.018	B	63	121	58
13	*	*	0.007	0.003	0.022	0.022	L	0.004	L	*	*	*
14	0.003	44	0.015	0.006	0.015	0.015	E	0.009	E	[illegible]	[illegible]	[illegible]
15	0.036	40	0.003	0.009	0.017	0.017		-0.006		[illegible]	121	[illegible]
16	0.031	36	0.008	0.012	0.019	0.019		-0.004		[illegible]	[illegible]	60
17	0.026	22	0.003	0.010	0.019	0.019		-0.007		[illegible]	[illegible]	47
18	*	*	0.007	0.011	0.016	0.016		-0.004		*	*	*
19	0.002	51	0.021	0.005	0.002	0.002		0.016		61	131	2
20	0.033	59	0.011	0.004	0.005	0.005		0.007		[illegible]	140	49
21	0.010	55	0.013	0.007	0.010	0.010		0.006		64	128	[illegible]
22	0.023	48	0.011	0.008	0.018	0.018		0.003		63	117	47
23	*	*	0.028	0.001	0.012	0.012		0.027		*	*	*
24	0.015	66	0.000	0.009	0.004	0.004		-0.009		[illegible]	137	24
25	0.026	49	0.005	0.008	0.027	0.027		-0.003		[illegible]	131	47
26	0.035	38	0.022	0.004	0.016	0.016		0.018		62	135	57
27	0.045	42	0.014	0.005	0.039	0.039		0.008		62	131	83
28	0.020	29	-0.001	0.008	0.011	0.011		-0.009		59	132	32
29	0.007	25	0.001	0.007	0.010	0.010		-0.006		56	130	12
30	0.024	20	0.004	0.006	0.025	0.025		-0.002		62	135	40
31	0.059	16	0.004	0.003	0.036	0.036		0.001		61	137	59
SUM	0.958	-	0.417	0.219	0.494	0.494	N.A.	0.198	N.A.	-	-	1678
AVG	0.031	51	0.013	0.007	0.016	0.016	N.A.	0.006	N.A.	63	132	54
NBS	Q302	N300	Q300	Q303	Q301	Q305	Q306	Q311	Q313	N305	N307	N308

* DENOTES UNAVAILABLE DATA.
@ DENOTES NULL DATA.
N.A. DENOTES NOT APPLICABLE DATA.

SOLAR HEATING AND COOLING DEMONSTRATION PROGRAM

MONTHLY REPORT
SPACE HEATING SUBSYSTEM

SITE: ORTIZ AND REILL, LOT 8 ESCONDIDO, CA SOLAR/1087-79/01
REPORT PERIOD: JANUARY,1979

DAY OF MON.	SPACE HEATING LOAD MILLION BTU	SOLAR FR.OF LOAD PCT	SOLAR ENERGY USED MILLION BTU	OPER ENERGY MILLION BTU	AUX THERMAL USED MILLION BTU	AUX ELECT FUEL MILLION BTU	AUX FOSSIL FUEL MILLION BTU	ELECT ENERGY SAVINGS MILLION BTU	FOSSIL ENERGY SAVINGS MILLION BTU	BLDG TEMP DEG. F	AMB TEMP DEG. F
1	0.058	1	0.001	0.007	0.057	N	0.097	-0.000	0.001	72	48
2	0.041	2	0.001	0.008	0.040	O	0.069	-0.001	0.002	71	58
3	0.045	0	0.000	0.006	0.045	T	0.079	0.000	0.000	71	53
4	0.038	0	0.000	0.009	0.042		0.073	-0.001	0.000	72	54
5	0.025	0	0.000	0.003	0.025	A	0.046	0.000	0.000	71	55
6	0.020	1	0.000	0.004	0.020	P	0.037	-0.000	0.000	71	55
7	0.009	0	0.000	0.001	0.009	P	0.018	0.000	0.000	72	56
8	0.008	0	0.000	0.001	0.010	L	0.022	0.000	0.000	69	54
9	0.038	0	0.000	0.005	0.035	I	0.063	0.000	0.000	69	54
10	0.018	0	0.000	0.002	0.018	C	0.035	0.000	0.000	69	52
11	0.032	0	0.000	0.004	0.032	A	0.057	0.000	0.000	69	53
12	0.009	0	0.000	0.001	0.009	B	0.019	0.000	0.000	70	56
13	0.033	0	0.000	0.004	0.031	L	0.055	0.000	0.000	70	55
14	0.019	0	0.000	0.003	0.019	E	0.036	0.000	0.000	68	52
15	0.043	0	0.000	0.005	0.040		0.069	0.000	0.000	69	52
16	0.014	0	0.000	0.002	0.014		0.029	0.000	0.000	69	57
17	0.022	0	0.000	0.003	0.022		0.041	0.000	0.000	67	52
18	0.036	0	0.000	0.005	0.036		0.064	0.000	0.000	68	47
19	0.046	1	0.000	0.007	0.045		0.080	-0.000	0.001	66	46
20	0.055	14	0.008	0.009	0.048		0.083	-0.001	0.013	71	51
21	0.006	0	0.000	0.001	0.006		0.015	0.000	0.000	68	51
22	0.049	8	0.004	0.009	0.041		0.072	-0.001	0.007	69	50
23	0.074	68	0.050	0.020	0.024		0.044	-0.004	0.084	72	54
24	0.070	76	0.053	0.017	0.017		0.032	-0.004	0.089	70	53
25	0.028	0	0.000	0.004	0.028		0.050	0.000	0.000	67	48
26	0.034	0	0.000	0.004	0.034		0.061	0.000	0.000	65	45
27	0.057	21	0.012	0.009	0.045		0.078	-0.001	0.020	68	46
28	0.079	51	0.040	0.013	0.039		0.068	-0.002	0.067	70	43
29	0.091	53	0.049	0.015	0.042		0.073	-0.002	0.081	67	41
30	0.136	65	0.088	0.027	0.047		0.081	-0.005	0.147	71	47
31	0.073	43	0.031	0.021	0.042		0.072	-0.004	0.052	72	49
SUM	1.306	-	0.338	0.230	0.962	N.A.	1.719	-0.027	0.563	-	-
AVG	0.042	26	0.011	0.007	0.031	N.A.	0.055	-0.001	0.018	69	51
NBS	Q402	N400	Q400	Q403	Q401		Q410	Q415	Q417	N406	N113

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SOLAR HEATING AND COOLING DEMONSTRATION PROGRAM

MONTHLY REPORT
ENVIRONMENTAL SUMMARY

SITE: ORTIZ AND REILL, LOT 8 ESCONDIDO, CALIFORN SOLAR/1087-79/01
REPORT PERIOD: JANUARY,1979

DAY OF MONTH	TOTAL INSOLATION BTU/SQ.FT	DIFFUSE INSOLATION BTU/SQ.FT	AMBIENT TEMPERATURE DEG F	DAYTIME AMBIENT TEMP DEG F	RELATIVE HUMIDITY PERCENT	WIND DIRECTION DEGREES	WIND SPEED M.P.H.
1	1882	N	48	62	N	N	N
2	1129	O	58	67	O	O	O
3	1136	T	53	68	T	T	T
4	1575		54	73			
5	334	A	55	57	A	A	A
6	471	P	55	57	P	P	P
7	1168	P	56	63	P	P	P
8	1877	L	54	66	L	L	L
9	400	I	54	55	I	I	I
10	1702	C	52	65	C	C	C
11	1314	A	53	64	A	A	A
12	603	B	56	62	B	B	B
13	1422	L	55	*	L	L	L
14	824	E	52	62	E	E	E
15	302		52	56			
16	593		57	64			
17	473		52	54			
18	662		47	51			
19	1789		46	55			
20	1617		51	67			
21	711		51	63			
22	875		50	60			
23	1900		54	68			
24	388		53	61			
25	689		48	52			
26	1980		45	59			
27	2076		46	61			
28	641		43	49			
29	1921		41	53			
30	502		47	54			
31	424		49	52			
SUM	33379	N.A.	—	—	—	—	—
AVG	1077	N.A.	51	60	N.A.	N.A.	N.A.
NBS ID	G001		N113			N115	N114

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